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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/033,544	12/27/2001	Mark M. Hytros	6551 USA/CM/TICL/LE	7363

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APPLIED MATERIALS, INC.
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SANTA CLARA, CA 95050

EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 09/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/033,544

Applicant(s)

HYTROS ET AL.

Examiner

Karla Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-59 is/are pending in the application.
- 4a) Of the above claim(s) 11-59 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-59 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 0402
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-10, drawn to a gas delivery system, classified in class 156, subclass 345.34.
 - II. Claims 11-27, drawn to a substrate processing chamber, classified in class 156, subclass 345.34.
 - III. Claims 28-59, drawn to a method of processing a substrate in a single chamber, classified in class 427.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination does not require a blocker plate. The subcombination has separate utility such as in an apparatus without a plasma source.

3. Inventions III and I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus as claimed can be used to practice another and materially different process such as etching.

4. Inventions III and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus as claimed can be used to practice another and materially different process such as etching.

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5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification and/or because the search required for each of the groups is not required for the other groups, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Mr. Keith Tackett on 09/11/03 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-10. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11-59 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1 and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,624,498 to Lee et al.

10. Lee et al. disclose a gas delivery system comprising: a gas box comprising a first gas channel (100) having a first outlet and a second gas channel (200) having a second gas; a blocker plate (500) disposed below the gas box, the blocker plate having a plurality of holes (300); a showerhead (600) disposed below the blocker plate, the showerhead comprising columns having column holes (800) in communication with a top surface and a bottom surface of the showerhead and interconnected grooves

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(700) having groove holes (900) in communication with the bottom surface of the showerhead; the first outlet of the gas box adapted top supply a first gas through the blocker plate holes of the blocker plate to the column holes of the showerhead; and the second gas outlet of the gas box being coupled to the showerhead and adapted to supply a second gas through the interconnect grooves of the showerhead to the groove holes of the showerhead.

11. With respect to claim 5, the blocker plate is coupled to the showerhead (column 3, rows 50-51).

12. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,433,787 to Suzuki et al.

13. Suzuki et al. disclose a gas delivery system comprising: a gas box comprising a first gas channel (7) having a first outlet and a second gas channel (not pictured or numbered; column 9, rows 48-51) having a second gas outlet (not pictured or numbered); a blocker plate (19) disposed below the gas box, the blocker plate having a plurality of holes (16); a showerhead (18) disposed below the blocker plate, the showerhead comprising columns having column holes (17) in communication with a top surface and a bottom surface of the showerhead and interconnected grooves having groove holes n communication with the bottom surface of the showerhead; the first outlet of the gas box adapted top supply a first gas through the blocker plate holes of the blocker plate to the column holes of the showerhead; and the second gas outlet of the gas box being coupled to the showerhead and adapted to supply a second gas through the interconnect grooves of the showerhead to the groove holes of the showerhead.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claims 2 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,433,787 to Suzuki et al. as applied to claims 1 and 5 above, and further in view of U.S. Patent No. 5,595,606 to Fujikawa et al.

17. Lee et al. disclose the invention substantially as claimed and as described above.

18. However, Lee et al. fail to teach the gas box further comprises a temperature fluid control channel.

19. Fujikawa et al. teach the use of a temperature fluid control channel (Figure 1, 84) for the purpose of cooling a portion of a gas delivery system directly facing a wafer which is exposed to heat radiation of a high temperature from the wafer (column 6, rows 56 through column 7, row 4).

20. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a temperature fluid control channel in Suzuki et al. in order to cool a portion of the gas delivery system directly facing the wafer which is exposed to heat radiation of a high temperature from the wafer as taught by Fujikawa et al.

21. With respect to claims 9-10, Lee et al. disclose the invention substantially as claimed and as described above.

22. However, Lee et al. fail to teach the showerhead formed by coupling two plates together.

23. Fujikawa et al. teach the use of a gas delivery assembly/showerhead comprising multiple plates for the purpose of independently supplying a plurality of gases (column 2, rows 12-25). Fujikawa et al. further disclose the assembly can be modified to include 4 or more blocks (column 10, rows 63-67).

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24. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a showerhead comprising of two or more coupled plates in Lee et al. in order to independently supply a plurality of gases as taught by Fujikawa et al.

25. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. as applied to claims 1 and 5 above, and further in view of U.S. Patent Publication No. 2002/0152960 A1 to Tanaka et al. and Patent No. 3,981,791 to Rosvold.

26. Lee et al. disclose the invention substantially as claimed and as described above and including coupling the blocker plate to the showerhead (see Figure 3).

27. However, Lee et al. fail to teach the gas box further comprises slots formed on both side portions of the gas box, the gas delivery system further comprising inserts positioned in the slots, the showerhead being coupled to the gas box with screw disposed through the showerhead and through the gas box and threadingly coupled to the inserts.

28. Tanaka et al. teach securely bonding a plurality of laminated plates (gas box) over the entire area or a large portion of their interfacial structures (including the side portions) for the purpose of preventing radicals from entering the internal spaces (paragraph 17).

29. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have securely bonded the gas box and showerhead in Lee et al. in order to prevent radicals from entering the internal spaces as taught by Tanaka et al.

30. Lee et al. and Tanaka et al. disclose the invention substantially as claimed and as described above.

31. However, Lee et al. and Tanaka et al. fail to teach using slots for housing screws and inserts for threadingly coupling the showerhead and the gas box.

32. Rosvold teach using suitable means (a screw and an insert) for coupling a gas delivery system for the purpose of insulating a showerhead (111) from a screw and from a cover structure (column 4, rows 56-66).

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33. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided suitable means, such as a screw and an insert, in Lee et al. and Tanaka et al. in order to insulate a showerhead from the screw and a cover structure as taught by Rosvold.

34. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al., Tanaka et al. and Rosvold as applied to claims 3 and 5 above, and further in view of U.S. Patent No. 4,526,644 to Fujiyama et al.

35. Lee et al., Tanaka et al. and Rosvold disclose the invention substantially as claimed and as described above.

36. However, Lee et al., Tanaka et al. and Rosvold fail to teach the inserts comprising nickel.

37. Fujiyama et al. teach using nickel as a structural material for a treatment device using plasma for the purpose of preventing corrosion of the structural material, as well as preventing generation of dust (column 2, rows 30-42 and 49-56).

38. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided inserts comprising nickel in Lee et al., Tanaka et al. and Rosvold in order to prevent corrosion of the inserts and in order to prevent generation of dust as taught by Fujiyama et al.

39. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. as applied to claims 1 and 5 above, and further in view of U.S. Patent No. 4,526,644 to Fujiyama et al.

40. Lee et al. disclose the invention substantially as claimed and as described above.

41. However, Lee et al. fail to teach the inserts comprising nickel or a nickel-plated metal.

42. Fujiyama et al. teach using nickel as a structural material for a treatment device using plasma for the purpose of preventing corrosion of the structural material, as well as preventing generation of dust (column 2, rows 30-42 and 49-56).

43. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided inserts comprising nickel in Lee et al. in order to prevent corrosion of the inserts and in order to prevent generation of dust as taught by Fujiyama et al.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km


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